



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 2398/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Jervois Mining Ltd

### 1.3. Property details

Property: Exploration Licence 77/1332  
Exploration Licence 77/1333  
Local Government Area: Shire of Menzies & Shire of Sandstone  
Colloquial name:

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
11.31		Mechanical Removal	Mineral Exploration and Associated Activities

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Vegetation within the application area has been mapped at a 1:250,000 scale as the following Beard vegetation association: (Shepherd et al., 2001; GIS Database).</p> <ul style="list-style-type: none"> <li>- 18: Low woodland; mulga (<i>Acacia aneura</i>);</li> <li>- 19: Low woodland; mulga between sandridges;</li> <li>- 125: Bare areas; salt lakes;</li> <li>- 128: Bare areas; rock outcrops;</li> <li>- 142: Medium woodland; York gum &amp; salmon gum;</li> <li>- 411: Succulent steppe with open scrub; scattered bowgada &amp; jam over saltbush; and</li> <li>- 533: Low woodland; mulga &amp; cypress pine.</li> </ul> <p>Maunsell AECOM (herein referred to as Maunsell) was commissioned by Jervois Mining Ltd to undertake a baseline flora and vegetation assessment of the application areas between 19 and 21 January 2009. The vegetation communities recorded within the application area have been described by Maunsell (2009).</p>	<p>Jervois Mining Ltd has applied to clear up to 11.31 hectares within an application area totalling approximately 1,904 hectares for the purpose of mineral exploration. The application area consists of 11 separate east-west running drill lines which are spaced approximately 1.5 to 3 kilometres apart. The two southern-most drill lines are connected by a north-south running drill line. The length of each drill line varies between 1.5 to 7.5 kilometres and the width of the application area for each drill line is approximately 400 metres (GIS Database). The applicant has advised that drill holes will be spaced approximately 200 metres apart (Jervois Mining Ltd, 2008).</p> <p>A tracked drill rig will be used to undertake the exploration activities and the applicant has advised the use of this equipment will involve minor vegetation clearing (Jervois Mining Ltd, 2008). Jervois Mining Ltd has stated that the proposed exploration activities will not require drill pads, sumps or costeans.</p>	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).  to  Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>	<p>Maunsell (2009) comment that the condition of the vegetation throughout the application ranges from 'Excellent' to 'Degraded'. However, the majority of the vegetation within the application areas is in 'Excellent' to 'Very Good' condition with approximately 1,006 hectares (89.2%) of the application area in this condition (Maunsell, 2009).</p>

#### 1. Woodlands

**W1:** Open Woodland of *Eucalyptus oleosa* over Low Open Shrubland of *Acacia ramulosa* var. *ramulosa* over a Grassland of *Triodia rigidissima* on orange sands.

**W2:** Woodland of *Eucalyptus clelandii* over a mixed Shrubland on orange sands.

**W3:** Woodland of *Eucalyptus loxophleba* subsp. *supralaevis* over an Open Shrubland dominated by *Dodonaea viscosa* subsp. *angustissima*, *Templetonia sulcata* and *Atriplex stipitata* on orange sands.

#### 2. Shrublands and Samphires

**SH1:** Tall Shrubland of *Acacia aneura* var. *intermedia* and *Acacia ramulosa* var. *ramulosa* with occasional *Muehlenbeckia florulenta* over an Open Shrubland of *Dodonaea viscosa* subsp. *angustissima*, *Pittosporum angustifolium* and *Eremophila forrestii* over a Low Open Shrubland of *Solanum lasiophyllum* and *Maireana georgei* on orange sands.

**SH2:** Tall Shrubland of *Acacia inceana* subsp. *conformis* and *Eremophila miniata* over an Open Shrubland of *Dodonaea viscosa* subsp. *angustissima* and *Cratystylis subspinescens* on silty sand.

**SH3:** Shrubland of *Eremophila falcata*, *Cratystylis subspinescens* and *Maireana glomerifolia* on orange sands.

**SH4:** Tall Shrubland of *Eremophila scoparia* over a Shrubland of *Cratystylis subspinescens*, *Dodonaea viscosa* subsp. *angustissima*, *Ptilotus obovatus*, *Exocarpos aphyllus* and *Eremophila oldfieldii* on coarse orange sands.

**SH5:** Tall Shrubland of *Callitris canescens* and *Acacia aneura* var. *intermedia* over an Open Grassland of *Enneapogon polyphyllus* and *Aristida contorta* on orange silty sands.

**Sam 1:** Low Samphire Shrubland of *Tecticornia undulata*, *Tecticornia indica* subsp. *bidens*, *Tecticornia laevigata*, *Frankenia pauciflora* and *Maireana* aff. *amoena* on silty sands.

**Sam 2:** Low Shrubland of *Atriplex vesicaria*, *Disphyma crassifolium* subsp. *clavellatum*, *Maireana tomentosa* var. *tomentosa* and *Tecticornia* sp. (sterile) on orange clayey silt.

**Sam 3:** Low Samphire Shrubland dominated by *Tecticornia pterygosperma* on silty clay.

**Sam 4:** Open Low Heath dominated by *Maireana glomerifolia* and *Ptilotus obovatus* on orange silty sands.

**Sam 5:** Low Samphire Open Heath dominated by *Tecticornia doleiformis* and *Tecticornia undulata* on clayey silty sands.

### 3. Salt Lakes and Clay Pans

**Salt Lake (SL):** Bare Salt Lake (void of any remnant native vegetation).

**Clay Pan (CP):** Bare Clay Pan (void of any remnant native vegetation).

## 3. Assessment of application against clearing principles

### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

#### Comments **Proposal is not likely to be at variance to this Principle**

The application area is located predominately within the Yalgoo Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which encompasses an area of 4,139,708 hectares (GIS database). The Yalgoo IBRA bioregion is characterised by low woodlands to open woodlands of *Eucalyptus*, *Acacia* and *Callitris* on red sandy plains of the Western Yilgarn Craton and southern Carnarvon Basin (Desmond and Chant, 2001). The Yalgoo region is known to be particularly rich in ephemerals (Desmond and Chant, 2001).

The eastern-most sections of the northern and southern drill lines intersect with the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Eastern Murchison subregion comprises of broad plains of red-brown soils and breakaway complexes and red sandplains (Cowan, 2001). Vegetation is dominated by Mulga Woodlands often rich in ephemerals, hummock grasslands, saltbush shrublands and *Tecticornia* shrublands (Cowan, 2001; Maunsell, 2009).

Maunsell (2009) recorded a total of fifteen vegetation communities across the application areas. Given the widespread similarity of landforms and vegetation associations throughout the Yalgoo and Murchison regions (GIS Database; Shepherd et al., 2001), all of these vegetation communities are well represented in the region (Maunsell, 2009).

Maunsell (2009) recorded a total of 72 flora species from 40 genera and 25 families within the application areas. No Declared Rare Flora or Priority Flora species were recorded within the application areas. The number of flora species recorded within the application areas is unlikely to represent an area of high species richness compared to the surrounding vegetation, given the widespread distribution of similar vegetation communities and landforms throughout the Yalgoo and Murchison regions (GIS Database; Shepherd et al., 2001).

Jervois Mining Ltd has applied to clear up to 11.31 hectares within an application area which covers approximately 1,904 hectares. The proposed low impact exploration activities are unlikely to have any significant impact on the biodiversity of the area.

There were no introduced species (weeds) recorded during the vegetation assessment of the application areas (Maunsell, 2009). Weeds have the potential to adversely impact on the diversity within the application areas as

they compete for resources with native flora species. The disturbance of soil may promote weed growth, and there is a risk that the movement of contaminated soil and clearing equipment throughout and between the project areas may cause the spread of weed species. To minimise the risk of introducing weeds into the application areas the Assessing Officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of weed management.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Cowan (2001)  
Desmond and Chant (2001)  
Maunsell (2009)  
Shepherd et al. (2001)  
GIS Database:  
- Interim Biogeographic Regionalisation of Australia (subregions)  
- Interim Biogeographic Regionalisation of Australia  
- Pre-European Vegetation

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

**Comments** **Proposal is not likely to be at variance to this Principle**  
Maunsell (2009) recorded a total of fifteen vegetation communities across the application areas. The majority of the vegetation within the application areas is in 'Excellent' to 'Very Good' condition (Maunsell, 2009). The vegetation communities identified within the application areas are likely to be considered common for the area based on the extent of similar landforms and vegetation communities throughout the Yalgoo and Murchison regions (GIS Database; Shepherd et al., 2001).

The application area encompasses the surface and banks of Lake Barlee and the surrounding vegetation (GIS Database; Maunsell, 2009). Lake Barlee is a seasonal/intermittent saline lake which covers an area of approximately 194,510 hectares (Environment Australia, 2001; GIS Database). Lake Barlee is known to be a major breeding area for Banded stilts (*Cladorhynchus leucocephalus*), and estimates of approximately 200,000 nests have been reported (Department of the Environment, Water, Heritage and the Arts, 2009; Cowan, 2001). Burbidge and Fuller (1982) cited in Cowan (2001) suggest that Lake Barlee may be the most important breeding site for this species. The following advice was received from the Department of Environment and Conservation:

"The Banded stilt is known to use Lake Barlee as a major breeding ground, however, breeding is known to occur on a number of small low lying islets in the central and south-eastern arm. It should be noted that Lake Barlee has been nominated as a RAMSAR wetland of national significance. Looking at the maps supplied the area of proposed clearing would not likely impact on the breeding grounds" (Department of Environment and Conservation, 2008).

Based on the information supplied by Maunsell (2009) and the advice received from the Department of Environment and Conservation there is no evidence to suggest that the vegetation communities proposed to be cleared would be considered as significant or restricted fauna habitat for Banded stilts.

The fauna habitat present within the application area are considered

Given the widespread distribution of similar landforms and vegetation communities in areas adjacent to the application area, the vegetation within the application areas is unlikely to be considered as significant habitat for fauna. The low impact exploration clearing activities are unlikely to significantly impact on the quality or availability of fauna habitats that are present within the application areas.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Cowan (2001)  
Department of Environment and Conservation (2008)  
Department of the Environment, Water, Heritage and the Arts (2009)  
Environment Australia (2001)  
Maunsell (2009)  
Shepherd et al. (2001)  
GIS Database:  
- ANCA, Wetlands  
- Hydrography, linear\_1  
- Pre-European Vegetation

**(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

**Comments Proposal is not likely to be at variance to this Principle**

According to available datasets there are no known records of Declared Rare Flora (DRF) or Priority Flora species within the application area (GIS database).

A flora and vegetation assessment was undertaken by botanists from Maunsell on between 19 and 21 January 2009 (Maunsell, 2009). Prior to the field survey a search of the Department of Environment and Conservation Threatened and Priority Flora database was conducted for the application areas (Maunsell, 2009). The search identified a total of one DRF and 31 Priority Flora species recorded within the vicinity of the project area (Maunsell, 2009). This included ten Priority One species, three Priority Two species, thirteen Priority Three species and 5 Priority Four species (Maunsell, 2009).

No species of DRF or Priority Flora were recorded within the survey area (Maunsell, 2009).

Maunsell (2009) has acknowledged that the field assessment was conducted at a time of the year that was not the most appropriate for recording the majority of annual and ephemeral plant species, including threatened flora potentially occurring within the application area. Information supplied by Maunsell (2009) indicates that the DRF and the majority of the Priority Flora taxa that may potentially occur within the project area flower between June and October, and as a result may not have been identifiable or present during the field survey.

The proposed clearing of up to 11.31 hectares within an application area of approximately 1,904 hectares is for exploration purposes (Jervois Mining Ltd, 2008). A tracked drill rig will be driven along each of the drill lines, and drill holes will be spaced approximately 200 metres apart (Jervois Mining Ltd, 2008). Jervois Mining (2008) has advised that no drill pads or sumps are required for the exploration activities. All of the vegetation communities identified within the application areas are well represented throughout the region (Maunsell, 2009). Any rare flora that may potentially occur within the application area are likely to continue to exist in undisturbed areas adjacent to the application areas. The proposed clearing for exploration activities is unlikely to impact on habitat for any significant plant communities.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Jervois Mining Ltd (2008)  
Maunsell (2009)  
GIS Database:  
- Declared Rare and Priority Flora List  
- Clearing Instruments

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

**Comments Proposal is not likely to be at variance to this Principle**

There are no known records of Threatened Ecological Communities (TEC's) within the application areas (GIS database). The nearest known TEC is located approximately 75 km south-east of the proposed clearing area (GIS database).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** GIS Database:  
- Threatened Ecological Communities

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

**Comments Proposal is not at variance to this Principle**

The clearing application areas fall within the Yalgoo and Murchison Interim Biogeographic Regionalisation for Australia (IBRA) regions in which approximately 99.0% and 100% of the pre-European vegetation remain respectively (see table) (GIS database; Shepherd et al., 2001).

The vegetation within the application areas has been mapped as Beard vegetation associations 18: Hummock Low woodland; mulga (*Acacia aneura*), 19: Low woodland; mulga between sandridges, 125: Bare areas; salt lakes, 128: Bare areas; rock outcrops, 142: Medium woodland; York gum & salmon gum, 385: Shrublands; bowgada & jam scrub with scattered York gum, 411: Succulent steppe with open scrub; scattered bowgada & jam over saltbush and 533: Low woodland; mulga & cypress pine.

According to Shepherd et al., (2001) approximately 100% of Beard vegetation associations 18, 19, 125, 128, 142, 411 and 533, and approximately 99.3% of Beard vegetation association 385 remain within the Yalgoo IBRA region (see table). According to Shepherd et al., (2001) approximately 100% of Beard vegetation associations 18, 19, 125, 128, 142, 385, 411 and 533 remain within the Murchison IBRA region (see table).

Beard vegetation association 142 is considered "Vulnerable" at State level with approximately 26.5% of the pre-European vegetation extent remaining. According to Shepherd et al. (2001) the current extent of Beard vegetation association 142 remaining within the Yalgoo and Murchison bioregion totals approximately 9,198 hectares (100%) and 61 hectares (100%) respectively (see table). Pre-European vegetation mapping indicates that the application area intercepts a portion of Beard vegetation association 142 within the Yalgoo IBRA region (GIS Database). There is no evidence to suggest that the proposed clearing activities would significantly impact on the amount of Beard vegetation association 142 that occurs within the Murchison IBRA region (GIS Database).

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for Beard vegetation associations 18, 19, 125, 128, 142, 411 and 533 within the Yalgoo and Murchison IBRA regions is of "Least Concern" (Department of Natural Resources and Environment, 2002).

Whilst only a small percentage of Beard vegetation 18, 19, 125, 128, 142, 411 and 533 within the Yalgoo and Murchison IBRA regions are protected within conservation reserves the Assessing Officer notes that the bioregions remain largely uncleared (Shepherd et al., 2001), therefore, the conservation of the vegetation associations within the bioregion are not likely to be impacted on by this proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Bioregion - Yalgoo	5,057,673	5,007,353	~99.0	Least Concern	0.0
IBRA Bioregion - Murchison	28,120,558	28,120,558	~100	Least Concern	1.1
<b>Beard veg assoc. – State</b>					
18	19,892,437	19,890,348	~100	Least Concern	2.1
19	4,385,296	4,384,255	~100	Least Concern	0.0
125	3,491,834	3,287,864	~94.2	Least Concern	6.9
128	329,872	280,593	~85.2	Least Concern	13.8
142	711,281	188,533	~26.5	Vulnerable	1.2
385	39,818	24,106	~60.5	Least Concern	0.0
411	44,036	44,036	~100	Least Concern	0.0
533	172,396	172,396	~100	Least Concern	0.0
<b>IBRA Bioregion – Yalgoo</b>					
18	101,332	101,332	~100	Least Concern	0.0
19	8,941	8,941	~100	Least Concern	0.0
125	106,869	106,869	~100	Least Concern	0.0
128	7,411	7,411	~100	Least Concern	9.2
142	9,198	9,198	~100	Least Concern	0.0
385	16,469	16,362	~99.3	Least Concern	0.0
411	11,881	11,881	~100	Least Concern	0.0
533	7,287	7,287	~100	Least Concern	0.0
<b>IBRA Bioregion Murchison</b>					
18	12,403,248	12,403,248	~100	Least Concern	0.4
19	104,889	104,889	~100	Least Concern	0.3
125	711,486	711,486	~100	Least Concern	0.5
128	24,583	24,583	~100	Least Concern	2.1
142	61	61	~100	Least Concern	0.0
385	5,530	5,530	~100	Least Concern	0.0
411	32,154	32,154	~100	Least Concern	0.0
533	165,108	165,108	~100	Least Concern	0.0

\* Shepherd et al. (2001)

\*\* Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes  
**(Department of Natural Resources and Environment 2002)**

Presumed extinct      Probably no longer present in the bioregion  
Endangered\*              <10% of pre-European extent remains

Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
<b>* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status</b>	

The vegetation under application is not considered a remnant of vegetation in a region that has been extensively cleared.

Based on the above, the proposed clearing is not at variance to this Principle.

**Methodology** Department of Natural Resources and Environment (2002)  
Shepherd et al. (2001)  
GIS Database:  
- Interim Biogeographic Regionalisation of Australia (subregions)  
- Pre-European Vegetation

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Comments Proposal is at variance to this Principle**

Geographic Information System (GIS) analysis indicates that the application area intercepts Lake Barlee which is described as a seasonal/intermittent saline lake which covers an area of approximately 194,510 hectares (Environment Australia, 2001; GIS Database). Lake Barlee has been identified as a wetland of national significance as it meets the following required inclusion criteria (Environment Australia, 2001):

- It is a good example of a wetland type occurring within a biogeographic region in Australia;
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex;
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail;
- The wetland supports 1% or more of the national populations of any native plant or animal taxa; and
- The wetland is of outstanding historical or cultural significance.

The total clearing application area comprises of eleven separate, east-west orientated application areas which are spaced approximately 1.5 to 3 kilometres apart. The two southern-most application areas are connected by a north-south running application area (GIS Database; Jervois Mining Ltd, 2008). Jervois Mining Ltd has applied to clear up to 11.31 hectares of native vegetation within an application area of approximately 1,904 hectares. The Assessing Officer notes that the majority of the areas under application occur outside of the defined environmentally sensitive area of Lake Barlee (GIS Database). GIS datasets indicate that all of the proposed drill lines are accessible over land that is not defined as an environmentally sensitive area.

As some of the vegetation under application is growing in association with a defined wetland the proposed clearing is at variance to this Principle.

The proposed exploration activities involve clearing for access tracks and drill holes on the surface and banks of Lake Barlee, and the surrounding vegetation. Jervois Mining Ltd has advised that a track drill rig will be used throughout the exploration program which will negate or minimise the need for blade down clearing (Jervois Mining Ltd, 2008). Although Jervois Mining Ltd has advised that no or little blade down clearing will be required, the driving of a track drill rig is likely to adversely impact on vegetation, and may also cause soil compaction. Localised areas of soil compaction may reduce the ability of the vegetation to re-establish during rehabilitation.

The Assessing Officer considers the clearing activities to be minor and low impact. Given the size of the proposed clearing in relation to the size of Lake Barlee, the proposed clearing activities are unlikely to significantly impact the environmental conservation values for Lake Barlee.

**Methodology** Environment Australia (2001)  
Jervois Mining Ltd (2008)  
GIS Database:  
- ANCA, Wetlands  
- Clearing Instruments  
- Clearing Regulations - Environmentally Sensitive Areas  
- Hydrography, linear\_1

**(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.**

**Comments Proposal may be at variance to this Principle**

According to Rangeland Land System Mapping the application areas comprise of the Bandy, Carnegie, Challenge, Doney, Marmion, Pindar and Yowie Land Systems (GIS Database).

- The Bandy Land System is characterised by gritty-surfaced plains and low outcrops of granite with scattered acacia shrublands. This land system is generally not susceptible to soil erosion (Payne et al., 1998).
- The Carnegie Land System is characterised by salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting *Tecticornia* shrublands. Lack of slope renders most of this land system not susceptible to water erosion, however, wind erosion may be exacerbated by loss of vegetative cover (Payne et al., 1998).
- The Challenge Land System is characterised by gently undulating gritty-surfaced plains, occasional granite hills, tors and low breakaways with acacia shrublands. Saline stony plains and alluvial plains are moderately susceptible to water erosion (Payne et al., 1998).
- The Doney Land System is described as alluvial plains with eucalypt woodland, and is generally not susceptible to soil erosion if undisturbed (Payne et al., 1998).
- The Marmion Land System is characterised by undulating sandplains with mixed shrublands and hummock grasslands. This land system is generally not susceptible to soil erosion provided the vegetative cover and soil surface is not disturbed (Payne et al., 1998).
- The Pindar Land System is described as loamy plains surrounded by sandplain supporting York gum woodlands and acacia shrublands. This land system generally has low susceptibility to erosion due to the lack of slope, and provided the vegetative cover is undisturbed (Payne et al., 1998).
- The Yowie Land System is characterised by loamy plains supporting shrublands of mulga and bowgada with patchy wanderie grasses. This system is generally not susceptible to soil erosion (Payne et al., 1998).

The Assessing Officer considers the proposed clearing activities to be minor and of low impact in relation to the size of the clearing application area and Lake Barlee. There is a risk of soil erosion occurring in some areas of the application area should the vegetative cover and surface mantles be disturbed. To minimise the risk of erosion and land degradation that may result from the clearing, the Assessing Officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of rehabilitation.

Much of the application area is located within or adjacent to Lake Barlee which is a non-perennial salt lake (Cowan, 2001; GIS Database). Groundwater salinities within the application area and adjoining areas have been recorded in the range of 3,000 - 35,000 milligrams/Litre Total Dissolved Solids (GIS Database). The proposed low impact exploration activities are not likely to increase land salinisation in the local area.

Based on the above, the proposed clearing may be at variance to this Principle.

**Methodology** Cowan (2001)  
Jervois Mining Ltd (2008)  
Payne et al. (1998)  
GIS Database:  
- Groundwater Salinity, Statewide  
- Rangeland Land System Mapping

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

**Comments Proposal is not likely to be at variance to this Principle**

The application area is not located within a Department of Environment and Conservation managed conservation area (GIS Database). The nearest conservation area is the 'A' Class Karroun Hill Nature Reserve which is situated approximately 45 kilometres south-west of the application area (GIS database). Based on the distance between the proposal and the nearest conservation area, the proposed clearing is not likely to impact on the conservation values of Karroun Hill Nature Reserve.

Geographic Information System (GIS) analysis indicates that the application area intercepts Lake Barlee which is described as a seasonal/intermittent saline lake which covers an area of approximately 194,510 hectares (Environment Australia, 2001; GIS Database). Lake Barlee has been identified as a wetland of national significance as it meets the following required inclusion criteria (Environment Australia, 2001):



- It is a good example of a wetland type occurring within a biogeographic region in Australia;
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex;
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail;
- The wetland supports 1% or more of the national populations of any native plant or animal taxa; and
- The wetland is of outstanding historical or cultural significance.

The Assessing Officer notes that the majority of the areas under application occur outside of the defined environmentally sensitive area of Lake Barlee (GIS Database). GIS datasets indicate that all of the proposed drill lines are accessible over land that is not defined as an environmentally sensitive area. The Assessing Officer considers the clearing activities to be minor and low impact. Given the size and type of the proposed clearing activities in relation to the size of Lake Barlee, the proposed clearing is unlikely to significantly impact the environmental conservation values for Lake Barlee.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Environment Australia (2001)  
 GIS Database:  
 - ANCA, Wetlands  
 - CALM Managed Lands and Waters  
 - Clearing Instruments  
 - Clearing Regulations - Environmentally Sensitive Areas  
 - Hydrography, linear\_1

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

**Comments** **Proposal is not likely to be at variance to this Principle**  
 The application area intercepts Lake Barlee which is a seasonal, intermittent salt lake which covers an area of 194,510 hectares (Environment Australia, 2001). The average annual rainfall for Cashmere Downs which is situated approximately 27 kilometres north-east of the application area is 252.9 millimetres, and the area experiences mean annual evaporation of 3200 millimetres (Bureau of Meteorology, 2008; GIS Database). For the majority of the year Lake Barlee is likely to remain dry. During normal season rainfall events it would be expected that there would be localised areas which may be subject to inundation, however, any surface water is likely to quickly infiltrate the soil or evaporate into the atmosphere. Lake Barlee has been known to fill approximately every 10 years, and surface water may persist for up to 1 year (Cowan, 2001; Australian Natural Resources Atlas, 2008), although it would be considered likely that any freshwater that enters the salt lake system would become saline.

The proposed activities will involve clearing for access tracks and drill pads on the surface and banks of Lake Barlee, as well as the surrounding vegetation. Jervois Mining Ltd has advised that a track drill rig will be used throughout the exploration program which will negate or minimise the need for blade down clearing (Jervois Mining Ltd, 2008). The Assessing Officer considers the proposed clearing activities to be minor and low impact given the type of proposed activities, size of the clearing application area and Lake Barlee. Given that Lake Barlee would infrequently hold surface water and is already considered saline, the proposed clearing activities are unlikely cause to deterioration in the quality of any surface water within Lake Barlee.

The application area is not located within a Public Drinking Water Source Area (GIS Database). The nearest PDWSA is the Depot Springs Water Reserve which is located approximately 142 kilometres north-east from the application area at its closest point (GIS Database). Given the distance separating the application area and the nearest water supply area, the proposed clearing is unlikely to impact on the quality of the Depot Springs Water Reserve.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Australian Natural Resources Atlas (2008)  
 Bureau of Meteorology (2008)  
 Cowan (2001)  
 Environment Australia (2001)  
 Jervois Mining Ltd (2008)  
 GIS Database:  
 - Evaporation Isopleths  
 - Public Drinking Water Source Areas

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Comments Proposal is not likely to be at variance to this Principle**

The application area intercepts Lake Barlee which is a seasonal, intermittent salt lake which covers an area of 194,510 hectares (Environment Australia, 2001; GIS Database). The average annual rainfall for Cashmere Downs which is situated approximately 27 kilometres north-east of the application area is 252.9 millimetres, and the area experiences mean annual evaporation of 3200 millimetres (BoM, 2008; GIS Database). During normal season rainfall events it would be expected that there would be localised areas which may be subject to inundation, however, any surface water is likely to quickly infiltrate the soil or evaporate into the atmosphere. Lake Barlee has been known to fill approximately every 10 years, and surface water may persist for up to 1 year (Cowan, 2001; Australian Natural Resources Atlas, 2008).

Given the low impact nature of the proposed clearing activities, it is unlikely that the clearing under this proposal will impact on drainage patterns for the Lake Barlee system.

The proposed clearing is unlikely to cause or increase the incidence of flooding or result in an increase in peak flood height.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology** Australian Natural Resources Atlas (2008)  
Bureau of Meteorology (2008)  
Cowan (2001)  
Environment Australia (2001)  
Jervois Mining Ltd (2008)  
GIS Database:  
- ANCA, Wetlands  
- Evaporation Isopleths

**Planning instrument, Native Title, Previous EPA decision or other matter.**

**Comments**

There are no Native Title claims over the area under application. The mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

Two direct interest submissions were received in relation to clearing permit application CPS 2398/1. One of the submissions stated there was no objection to the proposal, whilst the second submission was in relation to Sites of Aboriginal Significance and the cumulative impact of clearing activities on Exploration Licences 77/1332 and 77/1333.

It is the proponent's responsibility to liaise with the DEC and the DoW to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licence or approvals are required for the proposed works.

**Methodology** GIS Database  
- Native Title Claims - DLI 7/1/05  
- Sites of Aboriginal Significance DIA

**4. Assessor's comments**

**Comment**

The clearing principles have been addressed and the proposed clearing is at variance to Principle (f), may be at variance to Principle (g), is not likely to be at variance to Principle (a), (b), (c), (d), (h), (i) and (j), and is not at variance to Principle (e).

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, rehabilitation, record keeping and permit reporting.

**5. References**

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## 6. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government.
<b>CALM</b>	Department of Conservation and Land Management, Western Australia.
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia.
<b>DA</b>	Department of Agriculture, Western Australia.
<b>DEC</b>	Department of Environment and Conservation
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DoE), Western Australia.
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia.
<b>DMP</b>	Department of Mines and Petroleum
<b>DoE</b>	Department of Environment, Western Australia.
<b>DoIR</b>	Department of Industry and Resources, Western Australia.
<b>DOLA</b>	Department of Land Administration, Western Australia.
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environment Protection Act 1986, Western Australia.
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System.
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI</b>	Rights in Water and Irrigation Act 1914, Western Australia.
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia.
<b>TECs</b>	Threatened Ecological Communities.

### Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

- P3 Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4 Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

**{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-**

- Schedule 1 Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2 Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3 Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4 Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

**{CALM (2005). Priority Codes for Fauna. Department of Conservation and Land Management, Como, Western Australia} :-**

- P1 Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2 Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3 Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4 Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5 Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**Categories of threatened species (Environment Protection and Biodiversity Conservation Act 1999)**

- EX Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W) Extinct in the wild:** A native species which:  
 (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or  
 (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN Endangered:** A native species which:  
 (a) is not critically endangered; and  
 (b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU Vulnerable:** A native species which:  
 (a) is not critically endangered or endangered; and

(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

**CD**

**Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.